BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554

In the Matter of	)	
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380

To: The Federal Communications Commission

COMMENTS
OF THE
AMERICAN PETROLEUM INSTITUTE

The American Petroleum Institute ("API"), by its attorneys, is pleased to submit these Comments to the Federal Communications Commission ("FCC" or "Commission") in response to the Notice of Inquiry ("NOI") released on December 20, 2002.[1] The NOI solicits comment on whether the Commission should consider allowing the operation of unlicensed devices in additional frequency bands.

I. PRELIMINARY STATEMENT

1. API is a national trade association representing approximately 400 companies involved in all phases of the petroleum and natural gas industries, including the exploration, production, refining, marketing and transportation of petroleum, petroleum products and natural gas. The API Telecommunications Committee is one of the standing committees of the organization's General Committee on Information Management & Technology. The

[1] 68 Fed. Reg. 2730 (Jan. 21, 2003).

Telecommunications Committee evaluates and develops responses to state and federal proposals affecting telecommunications facilities used in the petroleum and natural gas industries.

2. API's Telecommunications Committee is supported and sustained by companies that are authorized by the Commission to operate telecommunications systems in various of the licensed radio services. For instance, API's members utilize facilities in the Private Land Mobile Radio Services ("PLMRS"), licensed under Part 90 of the FCC's rules, to support the search for and production of oil and natural gas, to ensure the safe pipeline transmission of natural gas, crude oil and refined petroleum products, to process and refine these energy sources and to facilitate their ultimate delivery to industrial, commercial and residential customers. Many API member companies also utilize facilities authorized in the Private Operational-Fixed Microwave Services ("POFS") pursuant to Part 101 to serve a variety of vital telecommunications functions (*e.g.*, communications with remote oil and gas exploration and production sites for voice and data applications, communications with refineries, the extension of circuits to remote pipeline pump and compressor stations, and supervisory control and data acquisition systems ("SCADA") that remotely monitor and control oil and gas wells, and pipelines). Additionally, some API member companies operate ship and private coast radio facilities (authorized under Part 80) and aviation radio facilities (governed by Part 87).

3. As a supplement to the aforementioned licensed radio systems, many API member companies operate unlicensed "spread spectrum" systems in the 902-928 MHz, 2.4 GHz and 5.8 GHz bands for both point-to-point and point-to-multipoint communications systems. These systems (like the licensed systems discussed above) are used for a variety of voice, as well as data, services for monitoring and control functions that help petroleum and natural gas companies conduct their day-to-day operations in a safe and efficient manner.

4. The continued operation of the licensed and unlicensed private radio systems employed by petroleum and natural gas companies is absolutely essential to protecting lives, health and property, both in support of the day-to-day operations of these companies, as well as during responses to emergency incidents. These systems are integral to the provision of our nation's energy resources to the public. Due to the critical importance of such systems to the operations of its members, API has been an active participant in all of the Commission's major rule making proceedings that have addressed the use of spectrum in the private (licensed) radio services and the availability of spectrum for unlicensed applications such as spread spectrum devices.

II. COMMENTS

5. The Commission seeks comment in its NOI on the feasibility of allowing unlicensed devices to be operated in additional spectrum bands, potentially including the television broadcast bands and the 3650-3700 MHz ("3650 MHz") band. For the reasons discussed below, API urges the Commission to: (1) ensure that PLMRS operations in the 470-512 MHz band are not subjected to harmful interference; (2) continue to pursue the potential use of the 3650 MHz band for additional unlicensed operations; and (3) recognize that new unlicensed spectrum allocations will not eliminate the need for future allocations for licensed systems.

A. PLMRS Operations in the 470-512 MHz Band Must Not be Subject to Interference from New Unlicensed Operations

6. In its discussion regarding the potential introduction of new unlicensed operations into the TV broadcast bands, the Commission recognizes that PLMRS operations are permitted

in the 470-512 MHz broadcast band in certain markets.[2] Several API member companies either operate or are considering the deployment of PLMRS systems in this band. The Commission correctly notes that such systems would need to be protected from interference from unlicensed devices, and, toward that end, it seeks comment on the technical requirements that would be needed to prevent interference to PLMRS licensees and other authorized services within the TV bands.[3]

7. As a general matter, API believes that the contemplated use of "white space" in the TV broadcast bands by new unlicensed devices likely would be problematic, particularly if the new devices are expected to proliferate in number. To begin with, the use of administrative controls (such as geographic restrictions) would not be sufficient to prevent interference from any devices that would be purchased, installed and operated by consumers. Further, while it may be possible for unlicensed devices to dynamically sense the presence of TV broadcast operations, it would be difficult (if not impossible) to design and manufacture devices that also could sense and protect the non-TV operations in the band (such as PLMRS systems), which differ from broadcast operations in terms of center frequency and modulation type. Accordingly, API urges the Commission not to allow any new unlicensed operations in the 470-512 MHz band unless and until technological advances make possible the deployment of devices that can ensure protection to PLMRS and other authorized systems in the band.

B. API Supports the Potential Expansion of Unlicensed Operations into the 3650 MHz Band

8. As discussed above, many API member companies operate spread spectrum

[2] See NOI at ¶¶ 12 and 15.

[3] *Id.* at ¶ 15.

unlicensed devices in the 902-928 MHz, 2.4 GHz and 5.8 GHz bands. Current provisions in the Commission's Part 15 rules that allow a substantial amount of power to be transmitted without a license using spread spectrum techniques have proven to be extremely successful. These provisions have paved the way for the development of a wide range of wireless products, many of which are being used by petroleum and natural gas companies to enhance the safety and efficiency of their operations.

9. The aforementioned spread spectrum bands have been so successful that congestion, not equipment design, now often limits applications in these frequency bands. Many API member companies report having encountered interference to their spread spectrum operations during the past several years. The following are just a few examples:

- One company has removed from service an unlicensed system in the 902-928 MHz band that was deployed along the Houston Ship Channel because it was receiving interference from a licensed LoJack vehicle tracking system. The company also was required, due to interference, to remove a 5.8 GHz path between downtown Houston and Bush Intercontinental Airport and replace it with a licensed 6 GHz system. Because the latter link is used to track helicopters in the Gulf of Mexico, as well as other important safety-related voice traffic, interference simply could not be tolerated.
- Several companies report increasing incidents of interference from wireless ISPs. As a result of such interference, one company is in the process of attempting to have two hops changed out.
- One natural gas pipeline company has experienced substantial interference to its spread spectrum operations in the 902-928 MHz and 2.4 GHz bands. The company has been able to continue operating by using isolation techniques such as antenna polarization, pattern switching and slot blocking.
- A petroleum company reports that it has had to replace its 902-928 MHz spread spectrum with 2.4 GHz spread spectrum due to interference and also has had to make system adjustments (such as the use of larger antennas or the relocation of antennas) to resolve interference problems.
- Another company states that it has had to abandon the implementation of spread spectrum systems in areas where interference became prevalent.

10. API believes that the simplicity of the original spread spectrum provisions turned

out to be a "double edged sword." The simplicity was beneficial to the extent that it fostered the relatively quick development of a wide variety of applications. The down side was that the absence of detailed technical standards likely has contributed to the interference problems that exist today in the unlicensed bands. Perhaps these problems could have been averted or at least minimized if more immunity to inter-system interference had been engineered into the system designs, either in terms of equipment-to-equipment dynamic coordination or the grouping of generally compatible types of equipment together in different parts of the band.

11. In any event, due to the types of congestion and interference problems described above, many API member companies would welcome the opportunity to employ unlicensed spread spectrum devices in additional frequency bands. Indeed, several member companies report that they would consider implementing a number of new spread spectrum links in the near or immediate future if additional spectrum were to be made available for the operation of such devices. Toward this end, API believes that the suggested spectrum at 3650 MHz is ideally suited for new unlicensed operations because it is low enough in the spectrum range to perform well in heavy rain fade areas and high enough that antenna directivity easily can be deployed to help reduce inter-system interference. API also agrees with the Commission that this band is a good candidate for new unlicensed operations because it is not heavily used in most parts of the country.[4] In view of the foregoing, API recommends that the Commission proceed with the contemplated expansion of unlicensed operations into the 3650 MHz band and that spread spectrum devices be permitted in any new allocation for unlicensed operations.

[4] NOI at ¶ 20.

C. New Unlicensed Applications and Devices Will Not Eliminate the Need for Licensed Operations and New Licensed Allocations

12. As discussed above, API would welcome the amendment of the Commission's rules to permit new unlicensed operations in the 3650 MHz band. At the same time, however, API cautions the Commission that expanded unlicensed operations will not be a panacea to the spectrum congestion and availability problems that the agency presently faces. While unlicensed operations serve some useful functions, they will not and should not replace licensed operations and the need for new spectrum allocations for licensed applications.

13. By way of example, API notes that some of its member companies have been using Internet Protocol ("IP") based telecommunications systems to improve and modernize their SCADA and remote data access systems. The benefits of such an approach include faster response time, greater monitoring capacity, the ability to have information available in many locations simultaneously, the ability to make multiple use of a single communications facility, the ability to make use of (and interface to) standard software, the ability to interact effectively with large data houses in the field, and the ability to modify software remotely. Unlicensed Wireless Ethernet Radio equipment (both point- to-point and point-to-multipoint) has been a cost-effective tool to get IP-type connectivity pushed out to many remote locations. Experience has shown, however, that the potential for interference with unlicensed devices is substantial and that the actual distance that can be covered with unlicensed devices is often far less than what the equipment specifications suggest could be accomplished without interference. Perhaps for this reason, many countries have concluded that there is a need for a coordinated/licensed version of wireless IP delivery systems for critical infrastructure companies, private businesses, municipalities and Wireless ISP's to use to reliably deliver IP-based services. API agrees that

there is an acute need for interference-protected wireless IP transmission systems.

14. Although API recognizes that the creation of a new coordinated allocation is outside the scope of this proceeding, it urges the Commission to consider concerns such as those described above as it decides how best to meet the wide variety of private, public safety and commercial communications needs that are presented to it. In particular, the Commission should recognize the practical limits of technologies that avoid the need to coordinate the use of frequencies. While technological advances may well make it possible for spread spectrum devices of the future to perform dynamic equipment-to-equipment frequency coordination, much time and effort will be needed to achieve such a result without constraining the functionality of the equipment or prohibitively increasing its cost. In the meantime (and perhaps indefinitely), many safety-related and other important communications needs will continue to require licensed spectrum allocations.

III. CONCLUSION

15. API appreciates the Commission's interest in identifying new spectrum for unlicensed operations, as it believes that existing unlicensed spectrum bands are highly congested and that permitting new unlicensed operations in other bands would enable companies to satisfy unmet needs and would foster the development of new unlicensed applications and equipment. However, API cautions that it may be technically infeasible to introduce new unlicensed operations into the 470-512 MHz TV band without causing harmful interference to PLMRS operations in that band. By contrast, it appears that the 3650 MHz band may be optimal spectrum in which to permit new unlicensed operations due to the sparsely used nature of the band at this time. Regardless of what path the Commission elects to follow with regard to

unlicensed spectrum use, API urges the Commission to recognize that licensed/coordinated spectrum allocations will continue to be needed for a variety of functions.

WHEREFORE, THE PREMISES CONSIDERED, the American Petroleum Institute respectfully submits the foregoing Comments and urges the Federal Communications Commission to act in a manner consistent with the views expressed herein.

Respectfully submitted,

THE AMERICAN PETROLEUM INSTITUTE

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Date: April 17, 2003